



DOCKET NO.: DMCI-0099
Application No.: 10/087,714
Office Action Dated: December 20, 2005

PATENT

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-15. (Canceled)

16. (Previously Presented) A method for improving vanillin production in *Vanilla planifolia*, comprising genetically engineering the *Vanilla planifolia* to overproduce an enzyme having the amino acid sequence of SEQ ID NO:2.

17-18. (Canceled)

19. (Previously Presented) The method of claim 16, wherein the enzyme is encoded by SEQ ID NO:1.

20. (Original) The method of claim 16, wherein the genetically engineered *Vanilla planifolia* is a cell or tissue culture.

21. (Original) The method of claim 16, wherein the genetically engineered *Vanilla planifolia* is a whole plant.

22. (Original) A genetically engineered *Vanilla planifolia* cell produced by the method of claim 16.

23. (Original) The cell of claim 22, which produces at least twice as much vanillin as does an equivalent cell which is not comparably genetically engineered.

24. (Original) A genetically engineered *Vanilla planifolia* plant, regenerated from the cell of claim 22.

25. (Original) The plant of claim 24, which produces at least twice as much vanillin as does an equivalent plant which is not comparably genetically engineered.

26-29. (Canceled)

30. (Withdrawn) A method for improving vanillin production and accumulation in a *Vanilla planifolia* cell or tissue culture, which comprises:

a) genetically engineering the *Vanilla planifolia* to overproduce one or more enzymes associated with one or more steps of vanillin biosynthesis in the *Vanilla planifolia*, the steps selected from the group consisting of: chain shortening of p-coumaric acid to p-hydroxybenzaldehyde; chain shortening of ferulic acid to vanillin; hydroxylation of p-hydroxybenzyl alcohol to 3,4-dihydroxybenzyl alcohol or aldehyde; and methylation of 3,4-dihydroxybenzaldehyde to vanillin, thereby resulting in the improved vanillin production; and

b) inhibiting production or activity of vanillyl alcohol dehydrogenase in cells of the culture, thereby resulting in the improved vanillin accumulation.

31. (Withdrawn) A *Vanilla planifolia* cell or tissue culture produced by the method of claim 30.

32. (Withdrawn - Currently Amended) A method of expressing an enzyme having 4-hydroxybezeldehyde hydroxybenzaldehyde synthase activity in a cell of a plant comprising the steps of

- a) providing a plant cell;
- b) providing a polynucleic acid encoding a chain shortening enzyme having an amino acid sequence of SEQ ID NO:2; and
- c) genetically manipulating the plant cell to express the encoded enzyme.

33. (Withdrawn) The method of claim 32 wherein the plant cell is from *Arabidopsis thaliana*, *Vanilla planifolia* or *Agrostis palustris*.

34. (Withdrawn) The method of claim 33 wherein the plant cell is a *Vanilla planifolia* cell from a whole plant or from a tissue culture.

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35. (Withdrawn) The method of claim 32 further comprising the additional step of regenerating the cell into a whole plant.

36. (Withdrawn) A genetically engineered *Vanilla planifolia* plant produced by the method of claim 35.